Spot Safety Project Evaluation

Project Log # 200501251

Spot Safety Project # 07-98-224

**Spot Safety Project Evaluation, of the Flashing Traffic Signal Installation,
At the Intersection of SR 2686-Richardson Dr. at Sherwood Dr.,
In Reidsville, Rockingham County**

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

_____ 04/12/2005
Carrie L. Goodrich Date

Traffic Safety Project Engineer

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 07-98-224 – The Intersection of SR 2686-Richardson Dr. and Sherwood Dr., in Reidsville, Rockingham County

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis and an Odds Ratio comparison analysis of the treatment data has been completed to measure the effectiveness of the spot safety improvement. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasure chosen for the subject location was the installation of an overhead flashing traffic signal. A private citizen originally requested the improvements. Both SR 2686-Richardson Dr. and Sherwood Dr. are two-lane facilities with a speed limit of 35 mph at the treatment intersection. The subject location is controlled by stop signs on Sherwood Dr.

The initial crash analysis for this location was completed from July 1, 1995 through June 30, 1998 with a total of seven reported crashes. There were six Angle crashes, resulting in one class A injury and eight class B injuries. The final completion date for the improvement at the subject intersection was on December 4, 2000.

Comparison Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from October 1, 2000 through January 31, 2001. The before period consisted of reported crashes from April 1, 1997 through September 30, 2000 (3 Years, 6 Months) and the after period consisted of reported crashes from February 1, 2001 through July 31, 2004 (3 Years, 6 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The analysis also consisted of two different sets of data, the treatment and the comparison data. The treatment data consisted of all crashes within 150 feet of the subject intersection. The comparison

data consisted of a sum of all crashes within 150 feet of ten intersections located near the treatment intersection. The ten intersections that comprise the comparison data are as follows:

SR 2686-Richardson Dr. at SR 2516-Front St.
SR 2686-Richardson Dr. at Ridgewood Ave.
SR 2686-Richardson Dr. at Pinecrest Ave.-Benton Ln.
SR 2686-Richardson Dr. at Larkwood Dr.
SR 2686-Richardson Dr. at Fairway Dr.
SR 2686-Richardson Dr. at Coach Rd.
SR 2686-Richardson Dr. at Cresent Dr.
SR 2686-Richardson Dr. at Main St.-Northup St.
SR 2686-Richardson Dr. at Boyd St.-Park Dr.
SR 2686-Richardson Dr. at SR 2670-Scales St.

Please see attached *Location Map* for further detail. The following data table depicts the Naive Before and After Analysis for the treatment and comparison intersections. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasure. The Frontal Impact Crash types considered are as follows: Left turn, same roadway; Left turn, different roadways; Right turn, same roadway; Right turn, different roadways; Head on; and Angle.

Treatment Information

	Before	**After**	**Percent Reduction (-)/ Percent Increase (+)**
Total Crashes	7	4	- 42.9
Total Severity Index	15.00	4.70	- 68.7
Frontal Impact Crashes	6	4	- 33.3
Frontal Severity Index	16.01	4.70	- 70.6
Volume	7300	8100	11.0

Comparison Information

	Before	**After**	**Percent Reduction (-)/ Percent Increase (+)**
Total Crashes	53	51	- 3.8
Total Severity Index	4.07	3.47	- 14.7
Frontal Impact Crashes	19	13	- 31.6
Frontal Severity Index	2.95	4.42	49.8
Volume	8000	7900	- 1.3

Odds Ratio: Treatment versus Comparison

	Before	After	Percent Reduction (-)/ Percent Increase (+)
Treatment Total Crashes	7	4	---
Comparison Total Crashes	53	51	- 40.6 %

The naive before and after analysis at the treatment location resulted in a 42.9 percent decrease in Total Crashes, a 68.7 percent decrease in the Total Severity Index, and a 11.0 percent increase in Average Daily Traffic (ADT). The comparison locations experienced a 3.8 percent decrease in Total Crashes, a 14.7 percent decrease in the Total Severity Index, and a 1.3 percent decrease in ADT. The before period ADT year was 1998 and the after period ADT year was 2002.

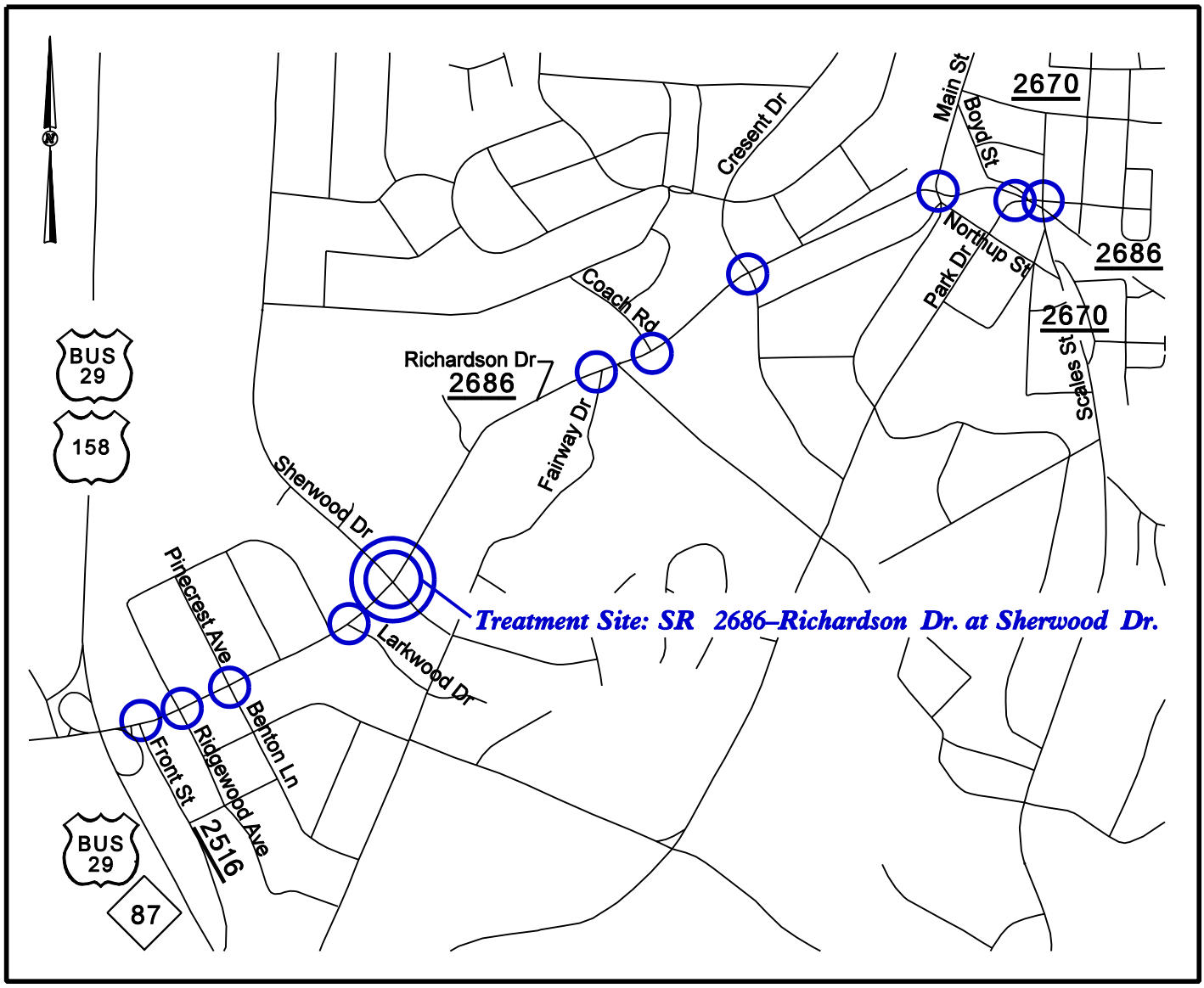
The Odds Ratio is used as another means of calculating the treatment effect. The number of crashes in the before and after period from the Comparison are used to calculate the percent reduction in crashes for the Treatment Intersection. As shown in the previous table, using the Odds Ratio calculation, there is a 40.6 percent decrease in Total Treatment Intersection crashes.

Results and Discussion

The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 42.9 percent decrease in Total Crashes and a 33.3 percent decrease in Frontal Impact Crashes. Using the Odds Ratio to calculate the treatment effect resulted in a 40.6 percent decrease in Total Crashes at the Treatment Intersection. The summary results above demonstrate that the treatment location appears to have had an decrease in the number of Total Crashes and a decrease in the number of Frontal Impact Crashes from the before to the after period. Please see the attached Treatment Site Photos. Photos are provided for each leg of the intersection.

The countermeasure crash reduction for Total Crashes at the subject intersection can be in the range of a 40.6 percent decrease to a 42.9 percent decrease in crashes. The countermeasure crash reduction for Frontal Impact Crashes at the subject intersection is a 33.3 percent decrease in crashes. As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors.

Evaluation of Spot Safety Project Number 07–98–224
Location Map, In Reidsville, Rockingham County



Comparison Sites: SR 2686–Richardson Dr. at SR 2516–Front St.

SR 2686–Richardson Dr. at Ridegwood Ave.

SR 2686–Richardson Dr. at Pinecrest Ave.–Benton Ln.

SR 2686–Richardson Dr. at Larkwood Dr.

SR 2686–Richardson Dr. at Fairway Dr.

SR 2686–Richardson Dr. at Coach Rd.

SR 2686–Richardson Dr. at Cresent Dr.

SR 2686–Richardson Dr. at Main St.–Northup St.

SR 2686–Richardson Dr. at Boyd St.–Park Dr.

SR 2686–Richardson Dr. at SR 2670–Scales St.

location map.dgn 11/08/2005 05:34:43 PM

Treatment Site Photo (Taken on February 17, 2005)

Looking north on Sherwood Dr.

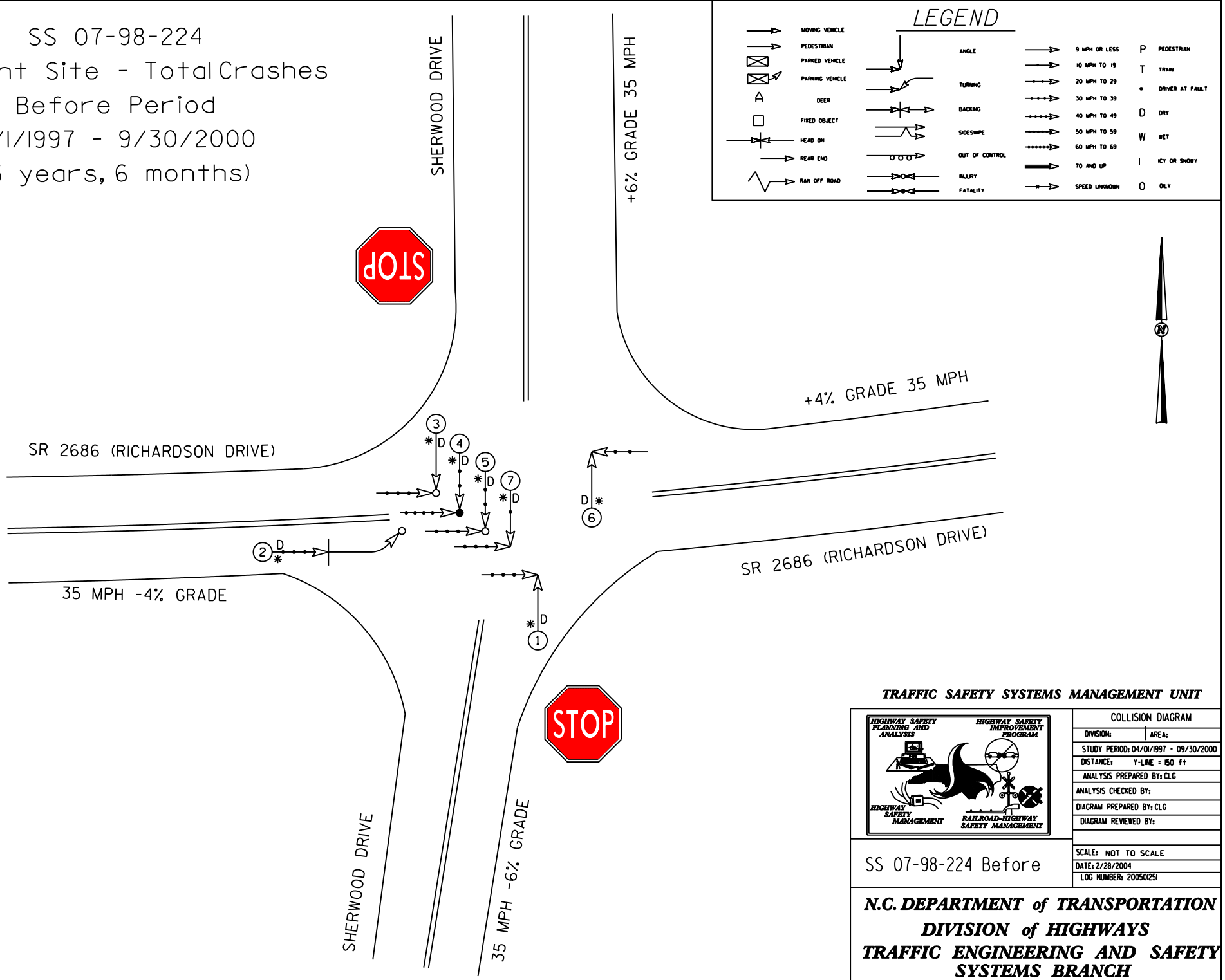
Looking south on Sherwood Dr.

Treatment Site Photo (Taken on February 17, 2005)

Looking east on SR 2686-Richardson Dr.

Looking west on SR 2686-Richardson Dr.

SS 07-98-224
Treatment Site - Total Crashes
Before Period
4/1/1997 - 9/30/2000
(3 years, 6 months)

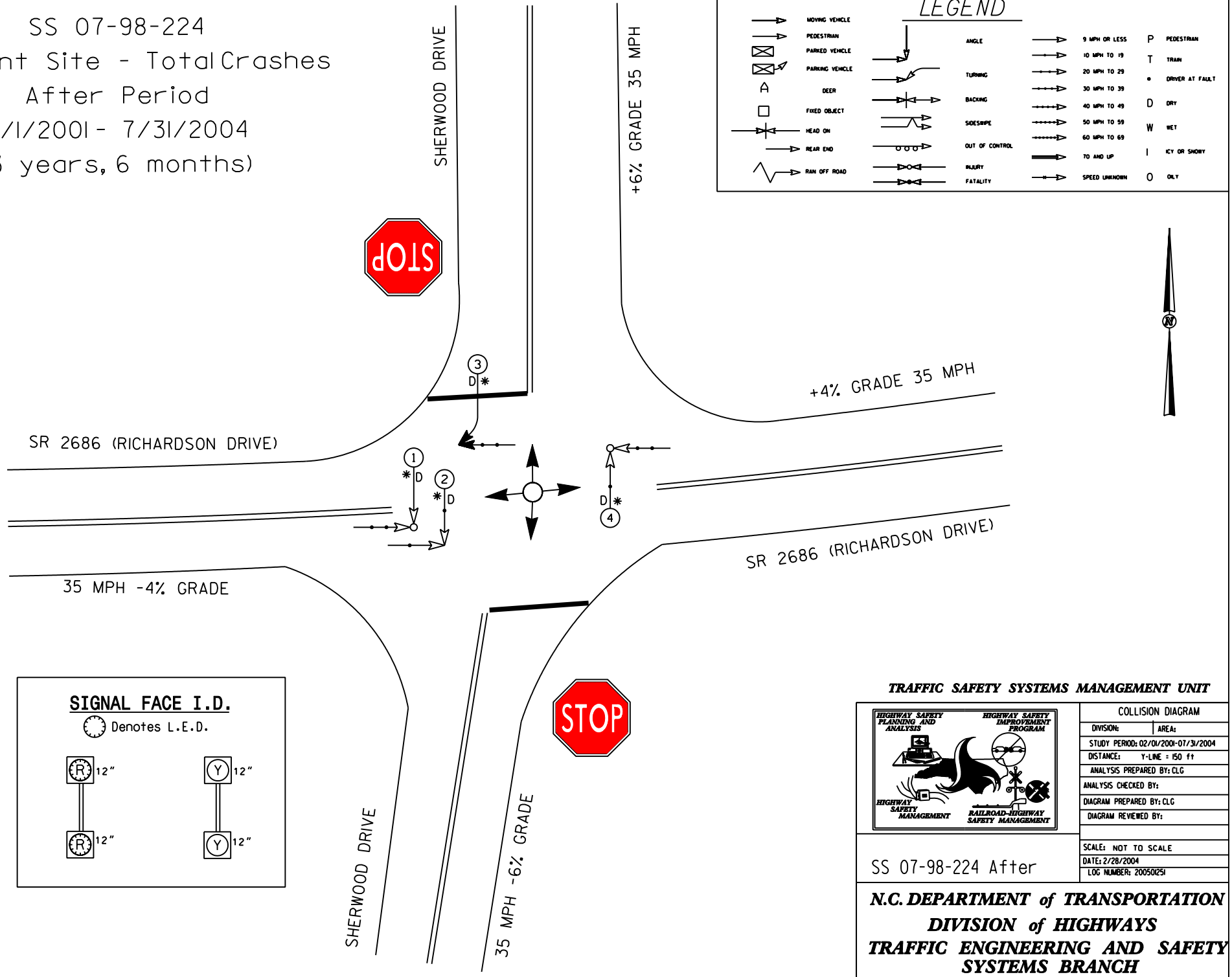


TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

HIGHWAY SAFETY PLANNING AND ANALYSIS / HIGHWAY SAFETY IMPROVEMENT PROGRAM / HIGHWAY SAFETY MANAGEMENT / RAILROAD-HIGHWAY SAFETY MANAGEMENT	COLLISION DIAGRAM
	DIVISION: AREA:
	STUDY PERIOD: 04/01/1997 - 09/30/2000
	DISTANCE: Y-LINE = 150 ft
	ANALYSIS PREPARED BY: CLG
	ANALYSIS CHECKED BY:
	DIAGRAM PREPARED BY: CLG
	DIAGRAM REVIEWED BY:
SS 07-98-224 Before	SCALE: NOT TO SCALE
	DATE: 2/28/2004
	LOG NUMBER: 20050125I

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

SS 07-98-224
Treatment Site - Total Crashes
After Period
2/1/2001 - 7/31/2004
(3 years, 6 months)



SIGNAL FACE I.D.

Denotes L.E.D.

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

HIGHWAY SAFETY PLANNING AND ANALYSIS
HIGHWAY SAFETY IMPROVEMENT PROGRAM
HIGHWAY SAFETY MANAGEMENT
RAILROAD-HIGHWAY SAFETY MANAGEMENT

COLLISION DIAGRAM

DIVISION:	AREA:
STUDY PERIOD: 02/01/2001-07/31/2004	
DISTANCE: Y-LINE = 150 ft	
ANALYSIS PREPARED BY: CLG	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: CLG	
DIAGRAM REVIEWED BY:	
SCALE: NOT TO SCALE	
DATE: 2/28/2004	
LOG NUMBER: 20050125I	

SS 07-98-224 After

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
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